

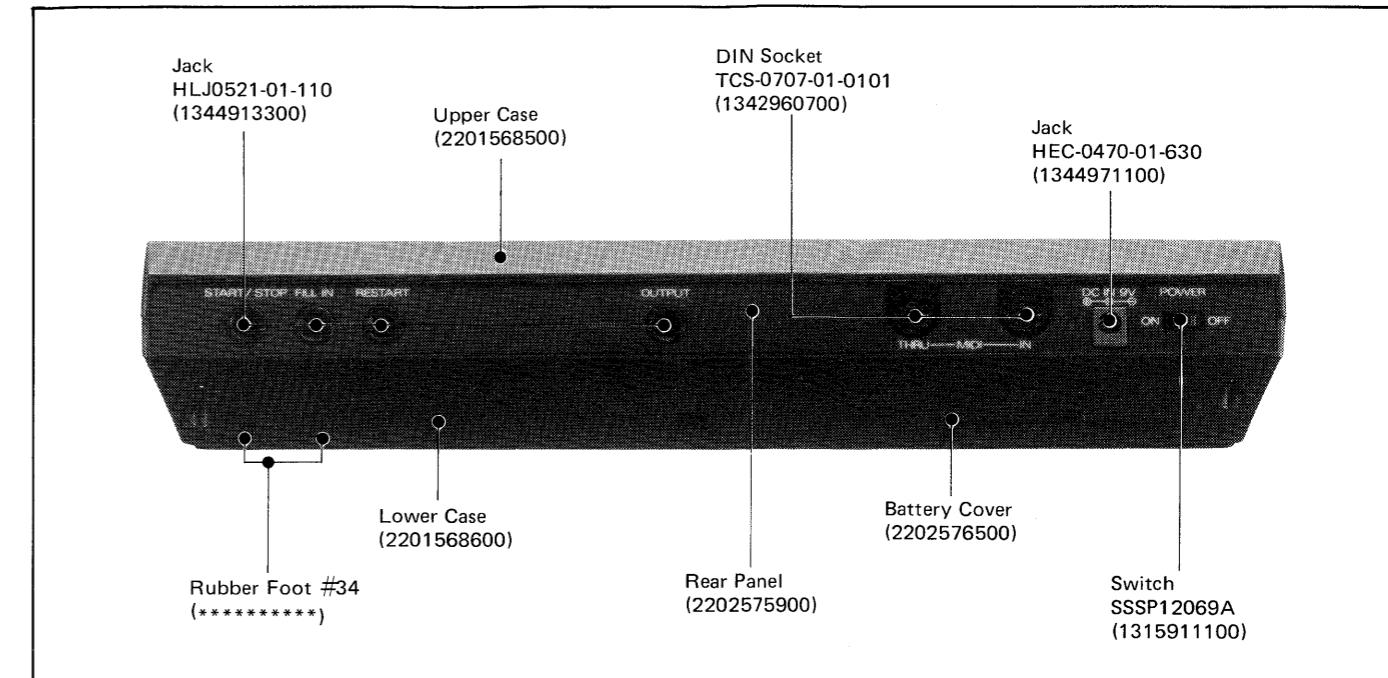
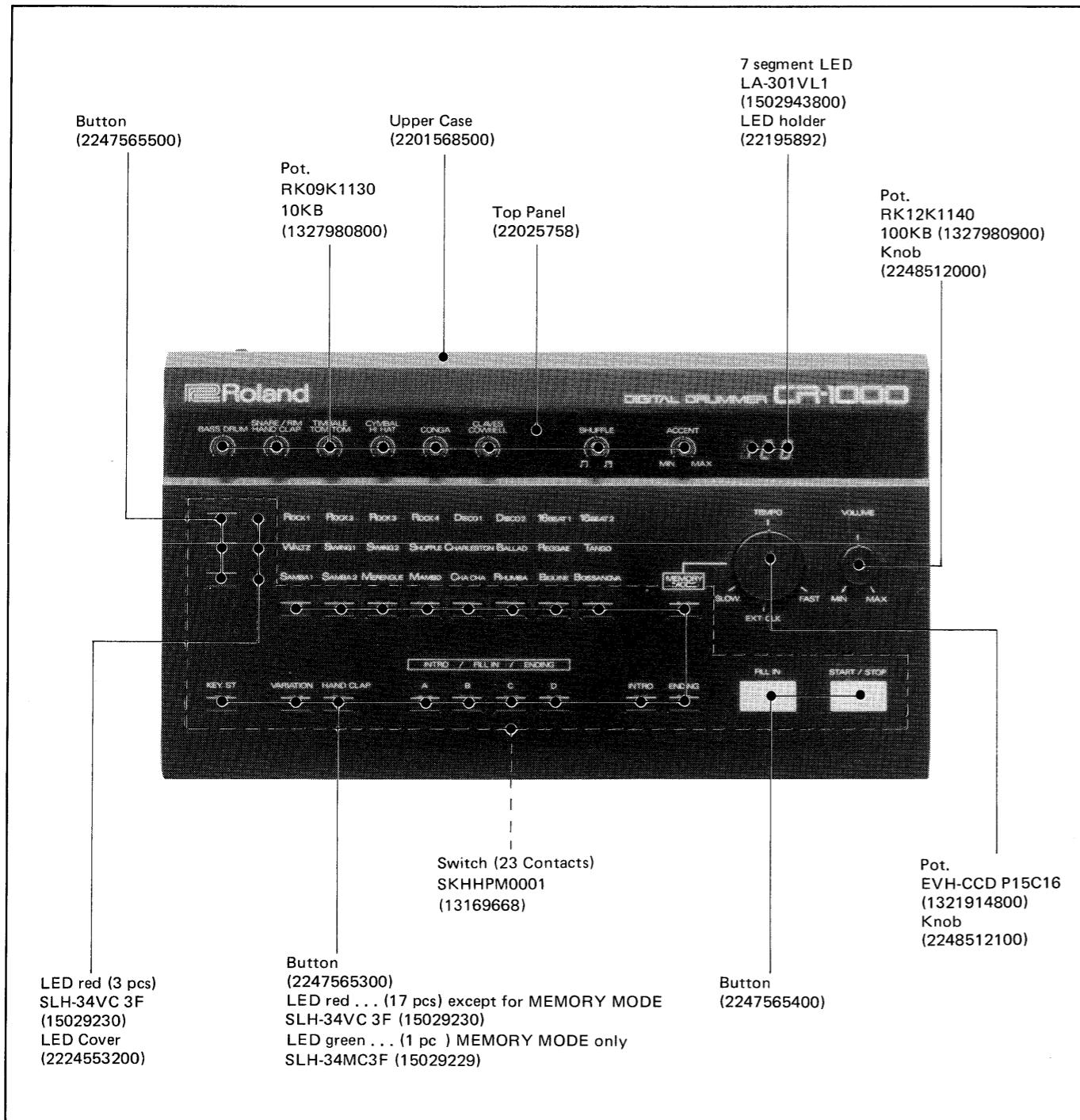
CR-100

SERVICE NOTES

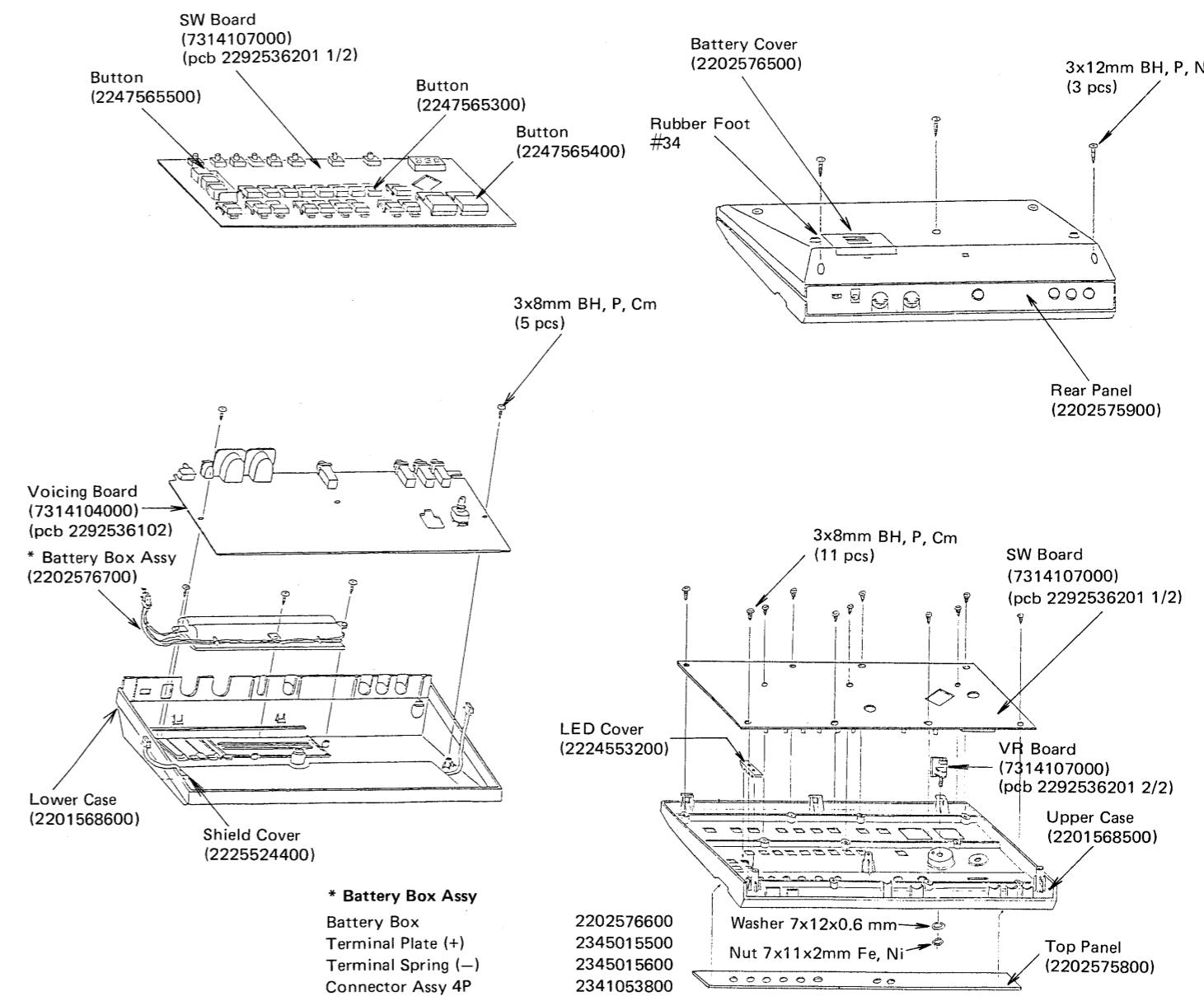
First Edition

SPECIFICATIONS

| | |
|---------------------------|---|
| Output | : Max. Level 3.5Vpp 100KΩ Noise Level -74.5dBm (IHFA) |
| Tempo | :  = 40 to 240 |
| Power Requirements | : 9V DC (7.5V – 9.7V) or AC Adaptor BOSS PSA-100, 120 or 240 |
| Current draw | : 100mA DC at 9V |
| Battery life | : 6 hours using SUM3 |
| Dimentions | : 304 (W) x 176 (D) x 60 (H) mm 11-15/16 x 6-15/16 x 2-3/8 in. |
| Weight | : 950 g/2 lb. 2 oz. including batteries |
| Accessories | : Connection Cord LP-25 |
| Options | : AC Adaptor BOSS PSA-100, 120, 220 or 240 Pedal Switch DP-2 |

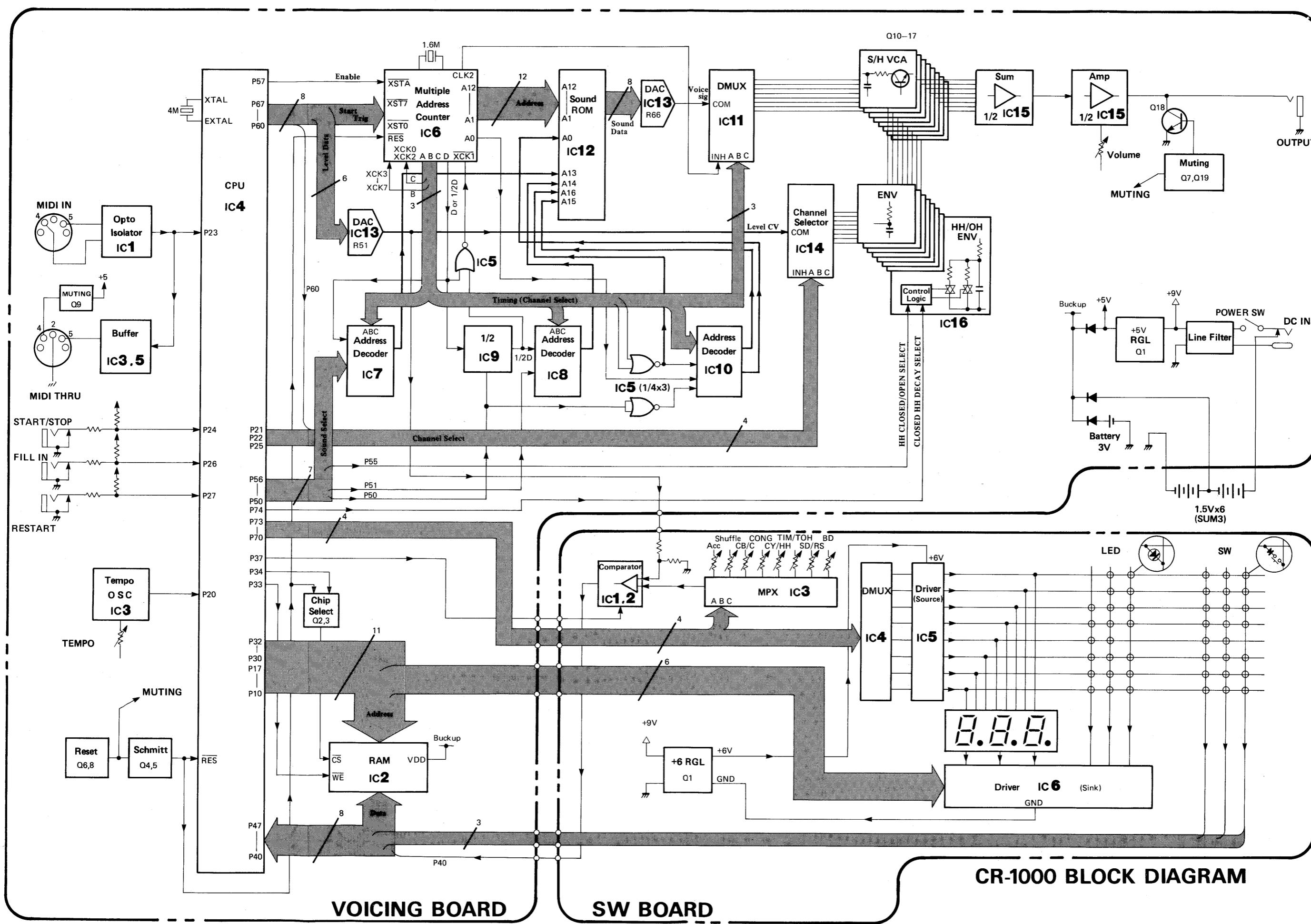


EXPLODED VIEW 分解図



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38

BLOCK DIAGRAM



CIRCUIT DESCRIPTIONS

GENERAL DESCRIPTION

The sound reproduction system in the CR-1000 works on a multiplexing. With this system plural sound data stored in a single sound ROM can be addressed in sequence from a multiplex address counter containing 8 13-bit counters . . . capable of generating 8 different addresses concurrently. Then the multiplexed sounds, fetched from the sound ROM and converted to corresponding analog voltages, are sampled into the S/H capacitor of individual channels.

The multiplex address counter has found application on some predecessors and its function and applications are explained on the service notes of TR707/727, DDR-30 and TR-505. Readers not familiar with MBH63H114 are recommended to read the circuit description on these service notes, especially TR505's because TR505 and CR-1000 are very similar to each other in circuit configuration. The tables 1, 2 and 3 are duplication of those on TR-505 Service Notes. Only one sound differs from that of TR-505 which contains "HI COWBELL" instead of "CLAVES".

回路解説

概論

CR-1000ではマルチ音源、マルチアドレスシステムが採用されています。ここで云うマルチシステムとは1個のサウンドROMに格納されている音源データを複数のアドレスを同時に発生するマルチプルアドレスカウンタで順次読み出して行きアナログ電圧に変換後DMUXで各チャンネルに振り分けて行く方法です。同様の方法がTR707/727, DDR-30, TR505にも採用されており、基本的動作は、これらのサービスノートで詳しく説明されています。特にTR505とCR-1000の構成は基本的に同じですので、TR505サービスノートを参照する事をお勧めします。

表1, 2, 3はTR505のサービスノートの表とほぼ同じですが、CR-1000での音源CLAVES(CLV)の部分だけTR505ではHICOWBELL(HCB)となり違っていますので注意して下さい。

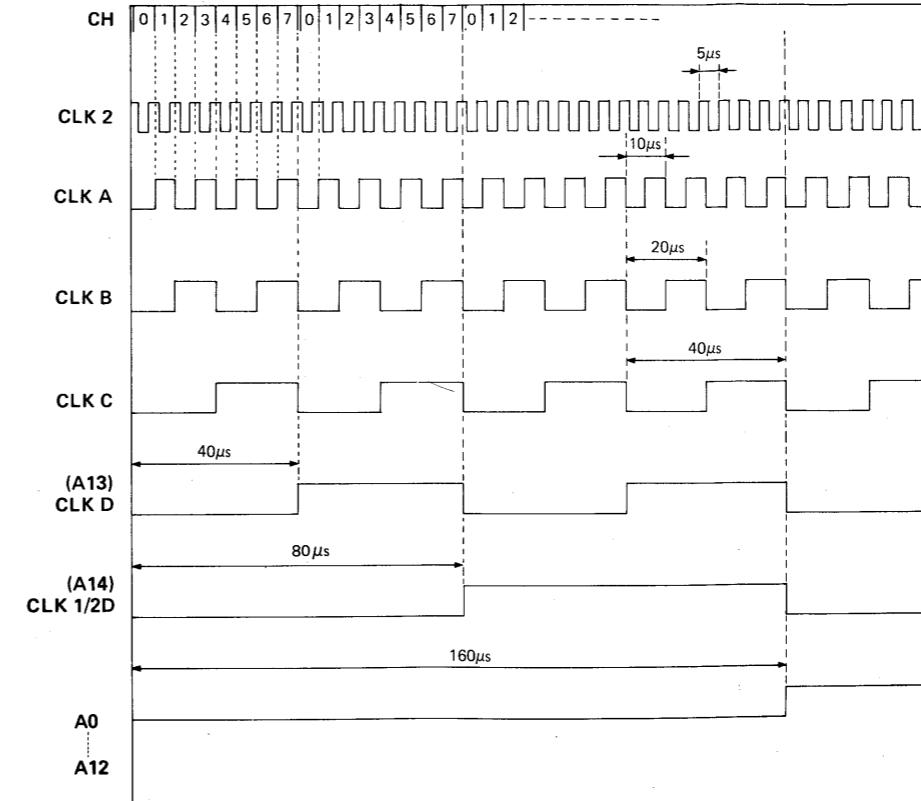
(TABLE 1)

| CH NO. | IC6 MB63H114 MULTIPLE ADDRESS COUNTER | | | | | | IC12 SOUND ROM | | | | | | | | |
|--------|---------------------------------------|---------|--------|-----------|--------|----------------|--------------------|--------------------------------------|--|--------------|------|------------------|------|------|--------|
| | INPUT | | | COUNTER | | OUTPUT | | | VOICE | | | CAPACITY (Bytes) | | | |
| | START | PIN NO. | CLOCK | PIN NO. | STEP | GATE ON PERIOD | PIN NO. | (OH) | (CH) | (RC) | (CC) | (LT) | (MT) | (HT) | (TIMB) |
| 0 | XST0=L | 38 | XCK0=C | 56 | 40μsec | GAT0=330msec | 32 | OPEN HI-HAT, CLOSED HI-HAT (OH) (CH) | | 8K | | | | | |
| 1 | XST1=L | 39 | XCK1=D | XCK1=1/2D | 57 | 80μs 160μs | GAT1= 660ms 1320ms | 31 | RIDE CYMBAL | CRASH CYMBAL | 16K | 32K | | | |
| 2 | XST2=L | 40 | XCK2=C | | 59 | 40μsec | GAT2=330msec | 30 | LOW TOM, MID TOM, HI TOM, TIMBAL (LT) (MT) (HT) (TIMB) | | 8K | | | | |
| 3 | XST3=L | 41 | XCK3=B | | 60 | 20μsec | GAT3=164msec | 29 | BASS DRUM (BD) | | 4K | | | | |
| 4 | XST4=L | 44 | XCK4=B | | 61 | 20μsec | GAT4=164msec | 28 | LOW CONGA, HI CONGA (LCG) (HCG) | | 4K | | | | |
| 5 | XST5=L | 45 | XCK5=B | | 62 | 20μsec | GAT5=164msec | 27 | SNARE DRUM (SD) | | 4K | | | | |
| 6 | XST6=L | 46 | XCK6=B | | 63 | 20μsec | GAT6=164msec | 25 | LOW COWBELL, CLAVES (LCB) (CLV) | | 4K | | | | |
| 7 | XST7=L | 47 | XCK7=B | | 64 | 20μsec | GAT7=164msec | 24 | HAND CLAP, RIM SHOT (HCP) (RIM) | | 4K | | | | |

The drum voices in the same channel can not be selected at the same time.
The letters in parentheses are the abbreviation to be shown in the display.

同一チャンネル内の複数音源は同時に鳴りません。
()内はグラフィックディスプレイ上の省略記号です。

TIMMING CHART (CRASH CYMBAL) タイミングチャート (Fig. 1)



SOUND ROM MAP (TABLE 3)

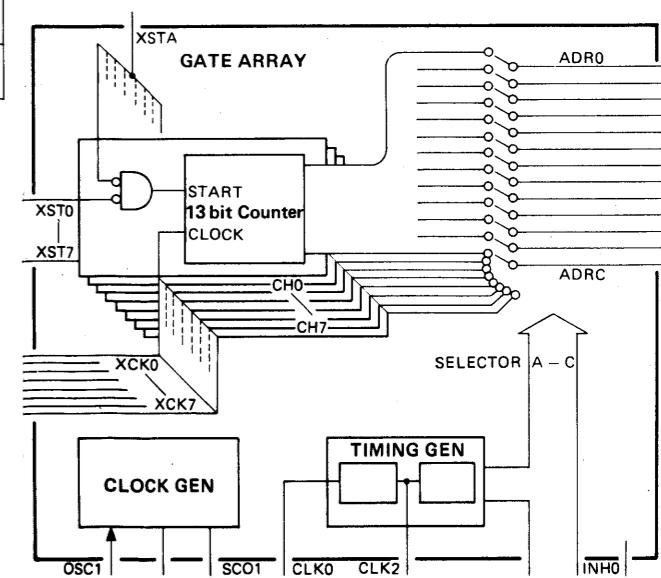
| | A ₁₆ | A ₁₅ | A ₁₄ | A ₁₃ | A ₁₂ -A ₁ | A ₀ |
|---------|-----------------|-----------------|-----------------|-----------------|---------------------------------|----------------|
| TIM(8K) | 0 | 0 | 0 | 0 | ʃ | A ₀ |
| LT(8K) | 0 | 0 | 0 | 1 | ʃ | A ₀ |
| HT(8K) | 0 | 0 | 1 | 0 | ʃ | A ₀ |
| MT(8K) | 0 | 0 | 1 | 1 | ʃ | A ₀ |
| BD(4K) | 0 | 1 | 0 | 0 | | 0(2n) |
| LCG(4K) | 0 | 1 | 0 | 0 | | 1(2n+1) |
| SD(4K) | 0 | 1 | 0 | 1 | | 0(2n) |
| HCG(4K) | 0 | 1 | 0 | 1 | | 1(2n+1) |
| HCP(4K) | 0 | 1 | 1 | 0 | | 0(2n) |
| LGB(4K) | 0 | 1 | 1 | 0 | | 1(2n+1) |
| RIM(4K) | 0 | 1 | 1 | 1 | | 0(2n) |
| CLV(4K) | 0 | 1 | 1 | 1 | | 1(2n+1) |
| | 1 | 0 | 0 | 0 | | A ₀ |
| CC(32K) | 1 | 0 | | | | |
| | 1 | 0 | | | | |
| | 1 | 0 | | | | |
| RC(16K) | 1 | 1 | 0 | 0 | | A ₀ |
| | 1 | 1 | 0 | 0 | | |
| OH(8K) | 1 | 1 | 1 | 0 | | A ₀ |
| CH(8K) | 1 | 1 | 1 | 1 | | A ₀ |

(2n)=EVEN
(2n+1)=ODD

SOUND ROM SELECTOR (TABLE 2)

| | | A ₀ | A ₁ -A ₁₂ | A ₁₃ | A ₁₄ | A ₁₅ | A ₁₆ | CH | Bytes |
|---------------|--------|-----------------|-----------------------------------|-----------------|-----------------|-----------------|-----------------|----|-------|
| OPEN HI-HAT | (OH) | AD ₀ | AD ₁ -AD ₁₂ | 0 | 1 | 1 | 1 | 0 | 8K |
| CLOSED HI-HAT | (CH) | AD ₀ | AD ₁ -AD ₁₂ | 1 | 1 | 1 | 1 | | 8K |
| CRASH CYMBAL | (CC) | AD ₀ | AD ₁ -AD ₁₂ | D | 1/2D | 0 | 1 | 1 | 32K |
| RIDE CYMBAL | (RC) | AD ₀ | AD ₁ -AD ₁₂ | D | 0 | 1 | 1 | | 16K |
| TIMBAL | (TIMB) | AD ₀ | AD ₁ -AD ₁₂ | 0 | 0 | 0 | 0 | | 8K |
| LOW TOM | (LT) | AD ₀ | AD ₁ -AD ₁₂ | 1 | 0 | 0 | 0 | | 8K |
| HI TOM | (HT) | AD ₀ | AD ₁ -AD ₁₂ | 0 | 1 | 0 | 0 | | 8K |
| MID TOM | (MT) | AD ₀ | AD ₁ -AD ₁₂ | 1 | 1 | 0 | 0 | | 8K |
| BASS DRUM | (BD) | 0 | AD ₁ -AD ₁₂ | 0 | 0 | 1 | 0 | 3 | 4K |
| LOW CONGA | (LCG) | 1 | AD ₁ -AD ₁₂ | 0 | 0 | 1 | 0 | 4 | 4K |
| HI CONGA | (HCG) | 1 | AD ₁ -AD ₁₂ | 1 | 0 | 1 | 0 | | 4K |
| SNARE DRUM | (SD) | 0 | AD ₁ -AD ₁₂ | 1 | 0 | 1 | 0 | 5 | 4K |
| LOW COWBELL | (LCB) | 1 | AD ₁ -AD ₁₂ | 0 | 1 | 1 | 0 | 6 | 4K |
| CLAVES | (CLV) | 1 | AD ₁ -AD ₁₂ | 1 | 1 | 1 | 0 | | 4K |
| HAND CLAP | (HCP) | 0 | AD ₁ -AD ₁₂ | 0 | 1 | 1 | 0 | 7 | 4K |
| RIM SHOT | (RIM) | 0 | AD ₁ -AD ₁₂ | 1 | 1 | 1 | 0 | | 4K |

GATE ARRAY 63H114 Multiple Address Counter



(CPU) SOUND SELECT SIGNAL

| CPU PORT | PIN NO. | "Hi" | "Low" |
|----------|---------|--------|--------|
| P50 | 17 | RC | CC |
| P51 | 18 | HT, MT | LT, TB |
| P52 | 19 | HCG | LCG |
| P53 | 20 | LT, MT | HT, TB |
| P54 | 21 | CLV | LCB |
| P55 | 22 | CH | OH |
| P56 | 23 | RIM | HCP |

TESTING

The built-in test program executes the following tests while in the TEST mode.

TEST PROGRAM

While holding down BEGUINE (Rhythm Key 7) and MEMORY MODE, switch the power on. The unit is now in the test mode.

To select tests 1 through 9, press START/STOP to increment the test number or press FILL IN to decrement.

Upon completion of test 2, 5, 6 or 7, the LED display will indicate the result as exemplified in Fig. A or Fig. B, respectively.

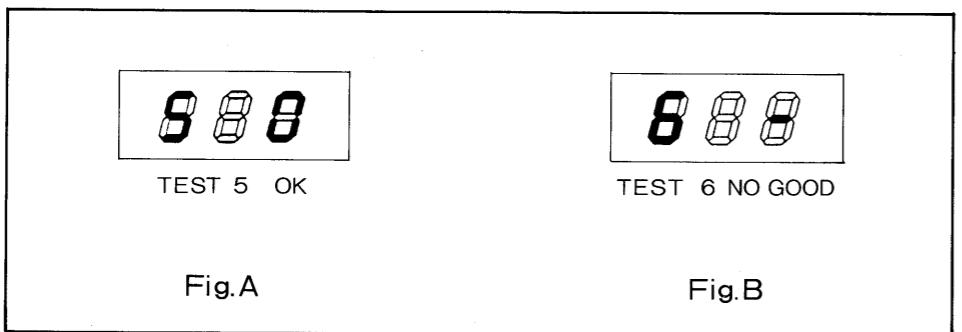


Fig.A

Fig.B

CAUTION

Both Factory and User's data in the backed up RAM IC2 will be erased somewhere during the TEST mode. Only the factory data can be revised by initializing the memory as instructed later. (Refer to "EXITING TEST MODE")

TEST 1. LEDs LIGHTING

While holding down BEGUINE (Rhythm Key 7) and MEMORY MODE, switch the power on. The unit is now in the test mode and executes TEST 1 automatically.

LEDs will light one by one in the order as shown in Fig. 1 and repeat the sequence.

(Each segment of the three 7-segment LEDs will light one by one in order at the same time.)

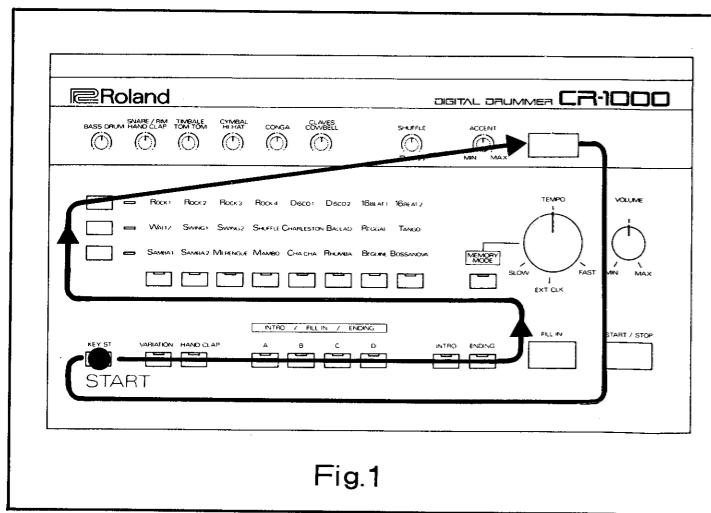


Fig.1

テスト

CR-1000には回路機能チェック用のプログラムが内蔵されています。このプログラムを走らせるにはテストモードに入る必要があります。

テストモード

リズムセレクタキー (BEGUINE) と MEMORY MODE のボタンを同時に押しながら電源をオンにするとテストモードにはいります。

テストは1から9まで有り、テストナンバーはSTART/STOPボタンを押す事により前進、FILL INで後退します。テスト2、5、6、7については下図のような良否判定表示が出ます。

TEST 2. SWITCHES

- 1) Press START/STOP.
- 2) Press panel button, except for START/STOP and FILL IN, one of 21 buttons at a time in any order.
- 3) Check the mated LED for lighting followed by a click of RIM SHOT. After the 21st button has been checked, all the LEDs will light again, this time, simultaneously.

TEST 2. スイッチ読み込み

- (1) START/STOPボタンを押します。
- (2) フロントパネル上の21個のボタン (START/STOP, FILL INを除く) のどれか1つを押します。
- (3) ボタンを押すごとに、それぞれのボタンに対応したLEDが点灯し同時にリムショット音が鳴ることを確認します。21個のボタン全てを押し終るとLEDが全て同時に点灯します。

テスト3. ボリューム動作

- 1) Press START/STOP: The leftmost digit will display "3" (TEST 3).
- 2) Press KEY ST. The rightmost digit display will show "1", signaling that BASS DRUM control is being selected.
- 3) Rotate BASS DRUM ccw, and then cw and check BANK LEDs for on or off according to the setting. (The audio output level will also vary.)
- 4) Repeat steps 2) and 3) for remaining knobs 2 to 8 shown in Fig. 2.

- (1) START/STOPボタンを押すと7セグメントLEDの左の桁にテストナンバー“3”が表示されます。
- (2) KEY STボタンを押すとBASS DRUMボリュームが選択されそのボリュームナンバー“1”がディスプレイの右の桁に表示されます。
- (3) 選択されたBASS DRUMボリュームを回し、3つのバンク用LEDが、それに伴って点灯する事を確認します。(音源の連打音の大きさも変化します。)
- (4) 残りの7つのボリュームについても同様にステップ(2)と(3)を繰り返し確認します。

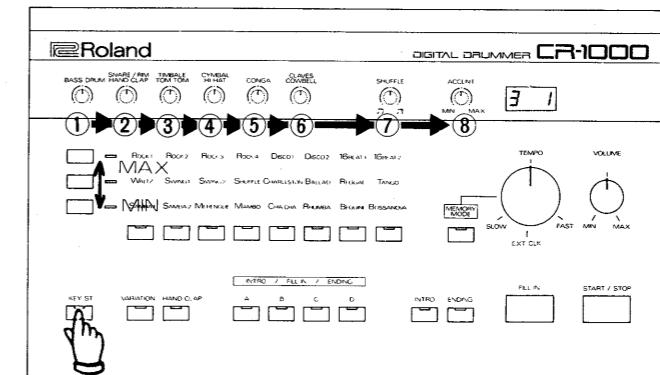


Fig.2

TEST 4. TEMPO DISPLAY

- 1) Press START/STOP. The 7 segment LEDs show the tempo speed to the TEMPO knob setting. (Max. = more than 240, Min. = less than 40).
- 2) Set TEMPO knob to EXT CLK position. The 7 segment LEDs should show "Ec".

テスト4. テンポ表示

- (1) START/STOPボタンを押します。テンポツマミで設定されたテンポを表示します。(最大240以上-最小40以下)
- (2) EXT CLKの位置にすると“Ec”を表示します。

TEST 5. RAM IC2 WRITING AND READING

CAUTION: TEST 5 erases the customer's data in RAM IC2.

Press START/STOP. The CPU writes the test data into RAM IC2, reads back the data, verifies it and displays the results as shown in the table below.

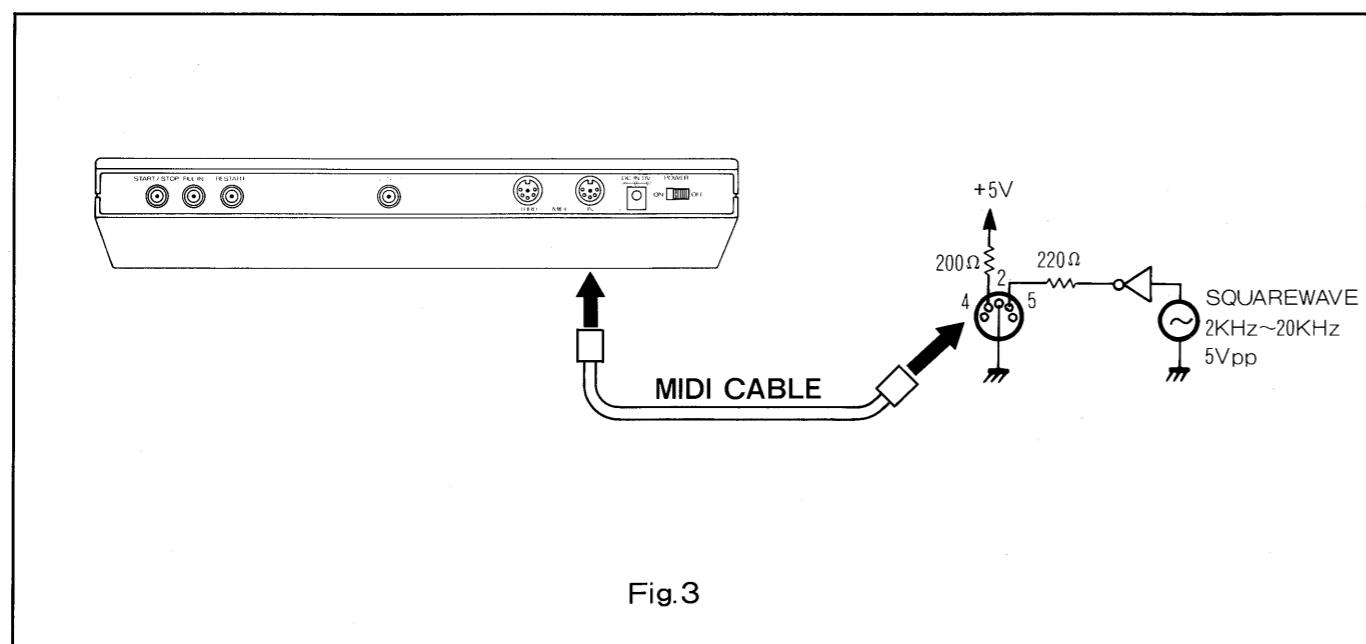
| DISPLAY | RESULT | SUSPECTIVE CIRCUIT |
|---------|-----------|--|
| | OK | _____ |
| | DEFECTIVE | Data bus (IC2 pin9, 10, 11, 13, 14, 15, 16, 17) Control signal (IC2 pin21, WR; pin18, CS) |
| | DEFECTIVE | The lower 8 bits of address bus. (CPU port 1: pin 43 through pin 50) |
| | DEFECTIVE | The higher 3 bits of address bus. (CPU port 30-32: pin 56 through pin 58) |

TEST 6. MIDI IN

- 1) Press START/STOP.
- 2) Apply a squarewave (5Vpp, 2KHz~20KHz) to MIDI IN jack as shown in Fig. 3. The CPU reads the squarewave and displays the result.

テスト 6. MIDI IN動作

- 1) START/STOP ボタンを押します。
- 2) 下図のように矩形波 (2KHz~20KHz程度、5Vpp) をMIDI INに加えるとCPUはこの矩形波を読み込みMIDI IN回路の良否判定表示をします。
(注 このテストはハードウェアのテストで、MIDI 信号そのもののテストではありません。)

**テスト 5. RAM(IC2)書き込み、読み出し**

注 このテストを実行するとRAM(IC2)に書き込まれているデータは全て書き替わります。

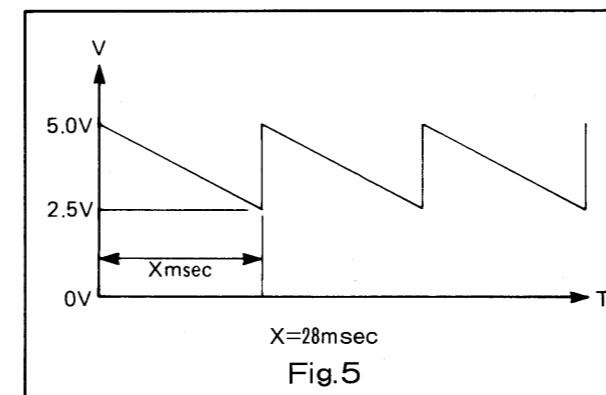
START/STOP ボタンを押します。CPUはRAM(IC2)にデータを書き込み、ベリファイし、RAMのリード、ライトが正しく行われているかチェックし下表のように良否判定表示をします。

TEST 7. START/STOP, FILL IN, RESTART JACK

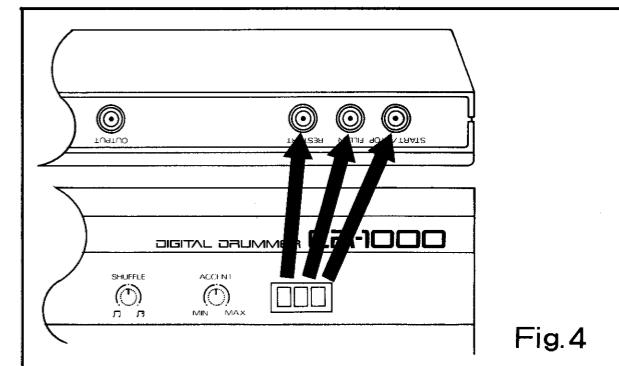
- 1) Press START/STOP. Each digit of the 7-segment LEDs corresponds to START/STOP, FILL IN and RESTART jacks, respectively, as shown in Fig. 4.
- 2) Connect open-circuit plug into START/STOP jack; CPU port 24 will be pulled up "H", causing corresponding digit LED to display "0".
- 3) Pull out the plug from the jack.
- 4) In the same way, check FILL IN and RESTART jacks.

TEST 8. DAC OUTPUT

- 1) Press START/STOP.
- 2) Connect the oscilloscope to the cathode of D9 on the voicing board and verify the waveform below.
- 3) Disconnect the scope.

**テスト 7. ジャック動作**

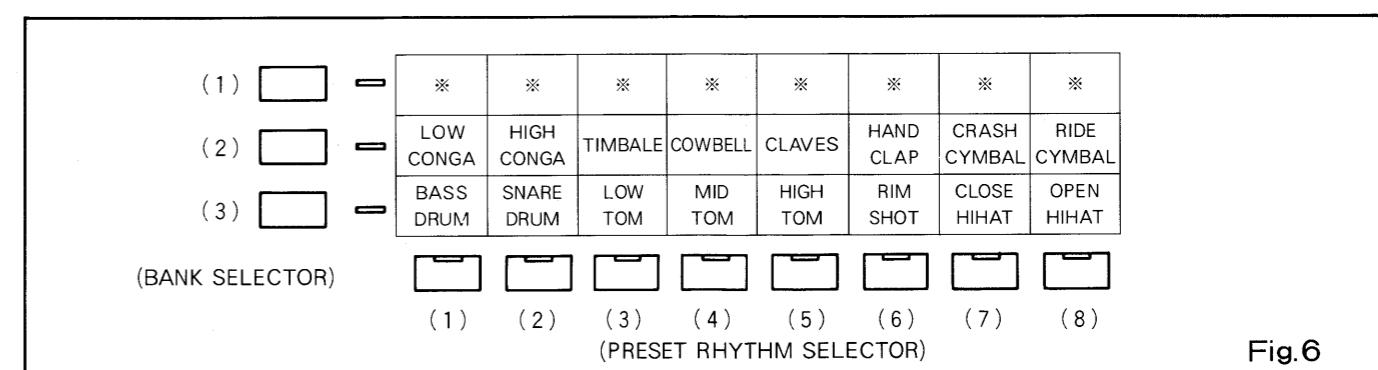
- 1) START/STOP ボタンを押します。
- 2) START/STOP, FILL IN, RESTART の各ジャックが下図の様に7セグメントLEDに、それぞれ対応します。
- 3) ジャックを抜きます。
- 4) 同様にFILL IN、RESTART ジャックも確認します。

**テスト 8. レベルデータD/A変換動作**

- 1) START/STOP ボタンを押します。
- 2) オシロスコープをボイス基板のD9のカソード側に接続し、左図の信号を確認します。
- 3) オシロスコープを外します。

テスト 9. 音出し動作

- 1) Press START/STOP button.
- 2) Select a particular sound by pressing Bank and Rhythm buttons as shown in Fig. 6 and verify the sound through monitoring.
- Repeat for the remaining sounds.

**EXITING TEST MODE**

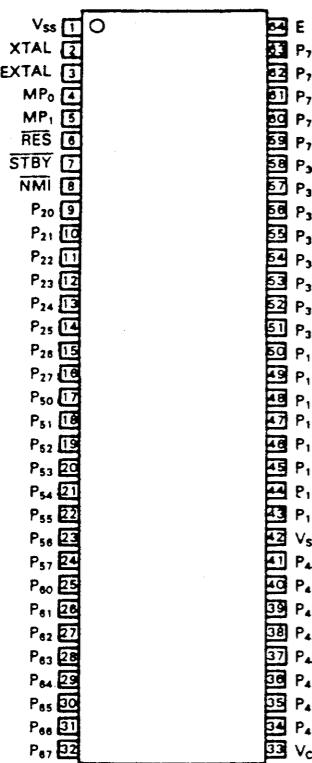
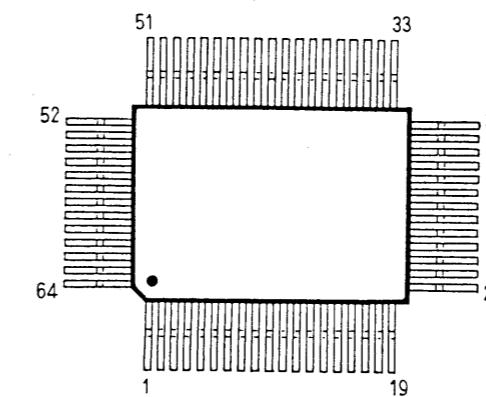
- * Press START/STOP. The RAM (IC2) will be initialized and the unit returns to the normal mode.
or
- * Turn off the power first. While holding down VARIATION and HAND CLAP, switch the power on again to initialize the RAM (IC2).

通常モードへ

- * テスト 9の状態からSTART/STOP ボタンを押します。または、
- * 一旦電源を切った後、VARIATIONとHAND CLAP ボタンを同時に押しながら電源をONします。上記のどちらかを実行する事でRAM (IC2)が、イニシャライズされ通常モードへ戻ります。

IC DATA

| Port Assignment | | |
|-----------------|-----------|--|
| PIN NO. | PORT NAME | DESCRIPTION |
| 1 | Vss | GND |
| 2 | XTAL | terminal, Xtal |
| 3 | EXTAL | terminal, Xtal or external system clock in |
| 4 | MPO | input, MCU mode setting pulled up +5V |
| 5 | MP1 | input, MCU mode setting pulled up +5V |
| 6 | RES | input, MCU reset (active low) |
| 7 | STBY | unused, pulled up +5V (active low) |
| 8 | NMI | unused, pulled up +5V (active low) |
| 9 | P20 | input, TEMPO CLOCK |
| 10 | P21 | output, Channel Selector INH |
| 11 | P22 | output, Channel Selector C |
| 12 | P23 | input, MIDI IN |
| 13 | P24 | input, START/STOP |
| 14 | P25 | output, Channel Selector B |
| 15 | P26 | input, FILL IN |
| 16 | P27 | input, RESTART |
| 17 | P50 | (RC/CC) |
| 18 | P51 | (HT, MT/LT, TB) |
| 19 | P52 | (HCG/LCG) |
| 20 | P53 | output, Sound Selector (LT, MT/HT, TB) |
| 21 | P54 | (CLV/LCG) |
| 22 | P55 | (CH/OR) |
| 23 | P56 | (RIM/HCP) |
| 24 | P57 | output, Enable |
| 25 | P60 | |
| 26 | P61 | |
| 27 | P62 | |
| 28 | P63 | output, Start Trigger |
| 29 | P64 | Level & D/A data |
| 30 | P65 | |
| 31 | P66 | |
| 32 | P67 | |
| 33 | Vcc | input, +5 power supply |
| 34 | P47 | |
| 35 | P46 | |
| 36 | P45 | input, SW Condition |
| 37 | P44 | |
| 38 | P43 | input/output, Ext RAM data bus |
| 39 | P42 | |
| 40 | P41 | |
| 41 | P40 | input, A/D Input |
| 42 | Vss | GND |
| 43 | P17 | |
| 44 | P16 | |
| 45 | P15 | LED data |
| 46 | P14 | |
| 47 | P13 | output, Ext RAM address bus |
| 48 | P12 | |
| 49 | P11 | LED data (for 7 seg.) |
| 50 | P10 | |
| 51 | P9 | output, A/D Enable |
| 52 | P36 | unused |
| 53 | P35 | |
| 54 | P34 | output, Ext RAM CS |
| 55 | P33 | output, Ext RAM WR |
| 56 | P32 | |
| 57 | P31 | output, Ext RAM address bus |
| 58 | P30 | |
| 59 | P74 | output, Closed HH Decay Selector |
| 60 | P73 | |
| 61 | P72 | output, VR, SW & LED Matrix Selector |
| 62 | P71 | |
| 63 | P70 | |
| 64 | E | unused, system clock |

CPU HD6301Y0B33P
(HD6301Y0B57P)Pin Configuration
(Top View)GATE ARRAY
RD63H114Pin Configuration
(Top View)

| PIN | name | PIN | name | PIN | name |
|-----|-------|-----|--------|-----|-------|
| 1 | INHO | 23 | CST 6 | 45 | XST 5 |
| 2 | ADRC | 24 | GATE7 | 46 | XST 6 |
| 3 | A | 25 | GATE6 | 47 | XST 7 |
| 4 | D | 26 | VDD | 48 | TST 1 |
| 5 | B | 27 | GATE5 | 49 | TST 2 |
| 6 | ADR 7 | 28 | GATE4 | 50 | XSTA |
| 7 | C | 29 | GATE3 | 51 | MSEL |
| 8 | ADR 6 | 30 | GATE2 | 52 | CLK 1 |
| 9 | ADR 8 | 31 | GATE 1 | 53 | CLK 2 |
| 10 | VSS | 32 | GATE 0 | 54 | CLK 3 |
| 11 | ADR 9 | 33 | XRES | 55 | CLK 4 |
| 12 | ADR 5 | 34 | OSC i | 56 | XCK 0 |
| 13 | ADR 8 | 35 | SCO 0 | 57 | XCK 1 |
| 14 | ADR 4 | 36 | SCO 1 | 58 | VDD |
| 15 | ADR 3 | 37 | CLK 0 | 59 | XCK 2 |
| 16 | ADRA | 38 | XST 0 | 60 | XCK 3 |
| 17 | ADR 2 | 39 | XST 1 | 61 | XCK 4 |
| 18 | ADR 1 | 40 | XST 2 | 62 | XCK 5 |
| 19 | ADRO | 41 | XST 3 | 63 | XCK 6 |
| 20 | CST 0 | 42 | VSS | 64 | XCK 7 |
| 21 | CST 2 | 43 | XOUT | | |
| 22 | CST 4 | 44 | XST 4 | | |

Multiple Address Counters

| DESIGNATION | PIN | DESCRIPTION | I/O |
|-------------|------|--|-----|
| CST | 0 20 | counter 0 | I |
| | 2 21 | pulled up } continue start counter 2 | I |
| | 4 22 | { +5V } counter 4 | I |
| | 6 23 | counter 6 | I |
| XST | A 50 | XST0-XST7 enable, active low | I |
| | 0 38 | counter 0 | I |
| | 1 39 | counter 1 | I |
| | 2 40 | counter start, active low counter 2 | I |
| | 3 41 | counter 3 | I |
| | 4 44 | counter 4 | I |
| | 5 45 | counter 5 | I |
| | 6 46 | counter 6 | I |
| | 7 47 | counter 7 | I |
| XCK | 0 56 | counter 0 | I |
| | 1 57 | counter 1 | I |
| | 2 59 | counter 2 | I |
| | 3 60 | clock input | |
| | 4 61 | counter 3 | I |
| | 5 62 | counter 4 | I |
| | 6 63 | counter 5 | I |
| | 7 64 | counter 6 | I |
| | | counter 7 | I |
| XOUT | 43 | address(ADRO-ADRC) out enable, active low; high-HI z | I |
| ADR | 0 19 | ROM ADDRESS | 0 |
| | 1 18 | | 0 |
| | 2 17 | | 0 |
| | 3 15 | | 0 |
| | 4 14 | | 0 |
| | 5 12 | | 0 |
| | 6 8 | | 0 |
| | 7 6 | | 0 |
| | 8 9 | | 0 |
| | 9 11 | | 0 |
| | A 16 | | 0 |
| | B 13 | | 0 |
| | C 2 | | 0 |
| A | 3 | MUX,DMUX | 0 |
| B | 5 | channel | 0 |
| C | 7 | select | 0 |
| D | 4 | for 8 counters | 0 |
| INHO | 1 | 25kHz | 0 |
| OSCI | 34 | 100kHz | 0 |
| SCCO | 35 | 50kHz | 0 |
| SC01 | 36 | 25kHz | 0 |
| CLK | 0 37 | 12.5kHz | 0 |
| | 1 52 | internal | I |
| | 2 53 | clock | 0 |
| | 3 54 | generator | 0 |
| | 4 55 | master clock out 1.6MHz | I |
| XRES | 33 | system clock in 1.6MHz | I |
| MSEL | 51 | system clock 100kHz | 0 |
| TST1 | 48 | MUX | 0 |
| TST2 | 49 | nc | 0 |
| Vss | 10 | ROM inhibit | 0 |
| Vss | 42 | latch clock | 0 |
| VDD | 26 | chip enable | 0 |
| GAT | 0 32 | reset pulse, active low | I |
| | 1 31 | counter 12/13 bit select | I |
| | 2 30 | IC test | I |
| | 3 30 | pulled down | I |
| | 4 29 | | I |
| | 5 28 | | 0 |
| | 6 25 | | 0 |
| | 7 24 | | 0 |

PARTS LIST

CASING ケース

| | | |
|------------|--|-------------|
| 22015685 | Upper Case | 上ケース |
| 22015686 | Lower Case | 下ケース |
| 22025765 | Battery Cover | 電池カバー |
| 22025767 | Battery Box Assy (including the following 4 parts) | |
| | 電池ボックス完成品 (下記4点を含む) | |
| 2202576600 | Battery Box | 電池ボックス |
| 2345015500 | Terminal Plate (+) | 端子板 |
| 2345015600 | Terminal Spring (-) | 端子板 |
| 2341053800 | Connector Assy 4P | リード付コネクタ完成品 |
| 22025758 | Top Panel | トップパネル |
| 22025759 | Rear Panel | リアパネル |

KNOB, BUTTON ツマミ、ボタン

| | | |
|----------|------------------------------|----------------|
| 22475654 | Button (large) | モールドツマミ (大) |
| 22475653 | Button (small with a window) | モールドツマミ (小、窓付) |
| 22475655 | Button (small, 3P) | モールドツマミ (小、3連) |
| 22485121 | Knob rotary (large) | 丸ツマミ (大) |
| 22485120 | Knob rotary (small) | 丸ツマミ (小) |

PCB ASSY 基板完成品

| | | |
|------------|-------------------------------|---------|
| 7314107000 | SW Board (pcb 2292536201 1/2) | スイッチ基板 |
| 7314107000 | VR Board (pcb 2292536201 2/2) | ボリューム基板 |

Replacement pcb for SW board or VR board is available in a set of these two boards with SW board being the representative.
補修用基板はスイッチ基板 およびボリューム基板のセットとなっています。
補修用基板の代表名はスイッチ基板となります。

| | | |
|------------|--------------------------------|------|
| 7314104000 | Voicing Board (pcb 2292536102) | 音源基板 |
|------------|--------------------------------|------|

COIL コイル

| | | | |
|----------|-------------|-------------|---------|
| 12449272 | Line filter | GM-50510152 | ラインフィルタ |
|----------|-------------|-------------|---------|

JACK, SOCKET ジャック、ソケット

| | | | |
|----------|------------------|------------|------------------------------|
| 13429607 | TCS-0707-01-0101 | DIN | MIDI IN, MIDI THRU |
| 13449711 | HEC-0470-01-630 | AC Adapter | DC IN 9V |
| 13449133 | HLJ-0521-01-110 | monaural | START/STOP, FILL IN, RESTART |

SWITCH スイッチ

| | | |
|----------|------------|-------|
| 13159111 | SSSP12004A | POWER |
| 13169668 | SKHHPM0001 | |

POTENTIOMETER ボリューム

| | | | |
|----------|---------------|-------|--|
| 13219148 | EVH-CCDP15C16 | 1MC | TEMPO |
| 13279808 | RK09K1130 | 10KB | BASS DRUM, SNARE/RIM, HAND CLAP TIMBALE, TOM TOM, CYMBAL, HI HAT CONGA, COWBELL, SHUFFLE, ACCENT |
| 13279809 | RK12K1140 | 100KB | VOLUME |

CERAMIC RESONATOR 発振子

| | |
|----------|------------|
| 12389735 | CSA 1.6MHz |
| 12389729 | CSA 4.0MHz |

IC

| | | |
|------------|---------------|---------------------------------------|
| 15229825 | MB63H114PF | gate array |
| 15179248 | HD6301Y0B33P | CPU |
| 15179781 | HN62311BPC-10 | CMOS mask ROM (SOUND ROM) |
| 15179317 | TC5517APL | CMOS S-RAM |
| 15159105D0 | BU-4013B | CMOS |
| 15159106D0 | BU-4016B | CMOS |
| 15159113D0 | BU-4051B | CMOS |
| 15159116D0 | BU-4069UB | CMOS |
| 15159134D0 | BU-4028B | CMOS |
| 15169516 | TC74HC02P | H CMOS quad 2-input NOR gate |
| 15169532 | TC74HC51P | H CMOS dual 2 wide-2input AND/OR gate |
| 15169533 | TC74HC151P | H CMOS |
| 15189136 | M5218L | Op. amp hex inverter |
| 15229712 | PC-900 | photo coupler |
| 15189194 | BA6993 | comparator |
| 15149110 | M54562 | transistor array |
| 15149126 | BA914A | transistor array |

TRANSISTOR トランジスタ

| | | |
|------------|------------|-----|
| 15119106DR | 2SA933R | PNP |
| 15129136 | 2SC2878-A | NPN |
| 15129140 | 2SC2603E | NPN |
| 15129602 | 2SD667C | NPN |
| 15129616 | 2SD1469M-R | NPN |

DIODE ダイオード

| | | |
|------------|------------|-----------------|
| 15019125 | 1SS-133 | |
| 15019209T0 | S-5500G | rectifier 整流器 |
| 15019406 | MTZ6.8B | 6.8V zener ツエナー |
| 15019409 | MTZ5.6C | 5.6V zener ツエナー |
| 15029229 | SLH-34MC3F | LED green 緑 |
| 15029230 | SLH-34VC3F | LED red 赤 |
| 15029438 | LA-301VL1 | 7-seg. LED |

RESISTOR ARRAY 抵抗アレイ

| | | |
|----------|-------------|-------------------------------------|
| 13919118 | RGSD16L104G | R-2R ladder network (A/D converter) |
|----------|-------------|-------------------------------------|

CONNECTOR コネクタ

| | | |
|----------|------------------|-------------------|
| 13439320 | IL-S-4P-S2T2-EF | 4P (Voicing pcb) |
| 13439298 | IL-S-10P-S2T2-EF | 10P (Voicing pcb) |
| 13439331 | IL-S-11P-S2T2-EF | 11P (Voicing pcb) |
| 13439333 | IL-S-2P-S2T2-EF | 2P (Voicing pcb) |
| 13439332 | IL-S-5P-S2T2-EF | 5P (VR pcb) |

MISCELLANEOUS その他

| | | |
|----------|-------------------------------|--------------|
| 22195892 | LED Holder | (7-seg LED) |
| 12569255 | Lithium battery M2B-C200 3V | リチウム電池 |
| 12569105 | Dry cell SUM-3S 1.5V | 単三乾電池 |
| 22255244 | Shield Cover (for Lower case) | シールドカバー |
| 22245532 | LED Cover | LED カバー |
| ***** | Rubber Foot #34 | ゴム足 |

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39

SW BOARD

7314107000
(pcb 2292536201 1/2)

VR BOARD

7314107000
(pcb 2292536201 2/2)

ADVARSEL!

Lithiumbatteri. Eksplosionsfare.
Udskiftning må kun foretages af en sagkyndig,
og som beskrevet i servicemanual.

Lithium batteri må kun udskiftes med samme type og fabrikat.

ADVARSEL!

Lithiumbatteri. Fare for eksplosjon.
Må bare skiftes av kvalifisert tekniker som
beskrevet i servicemanualen.

Lithium batteri må kun utskiftes med samme type og fabrikat.

WARNING !

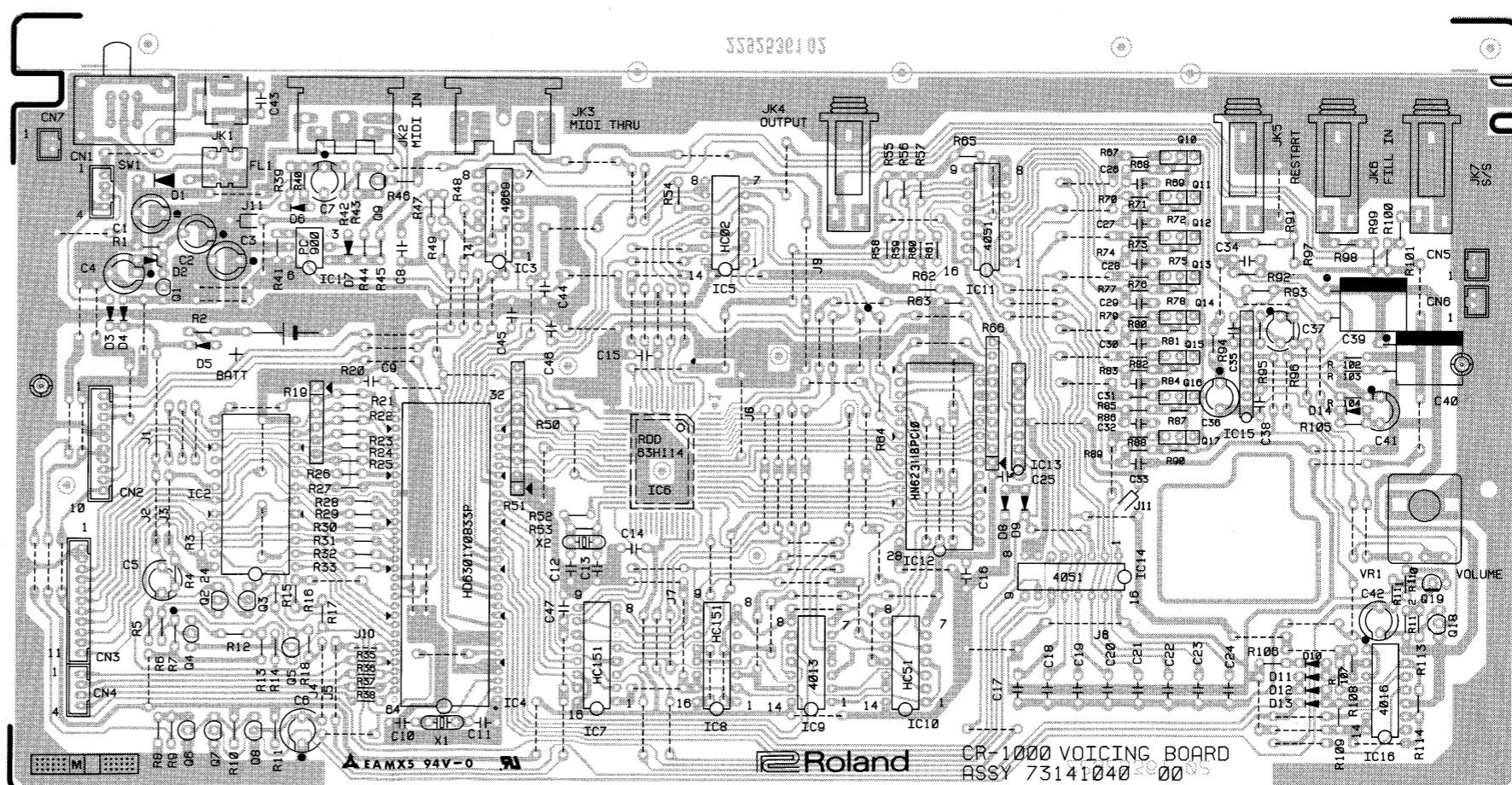
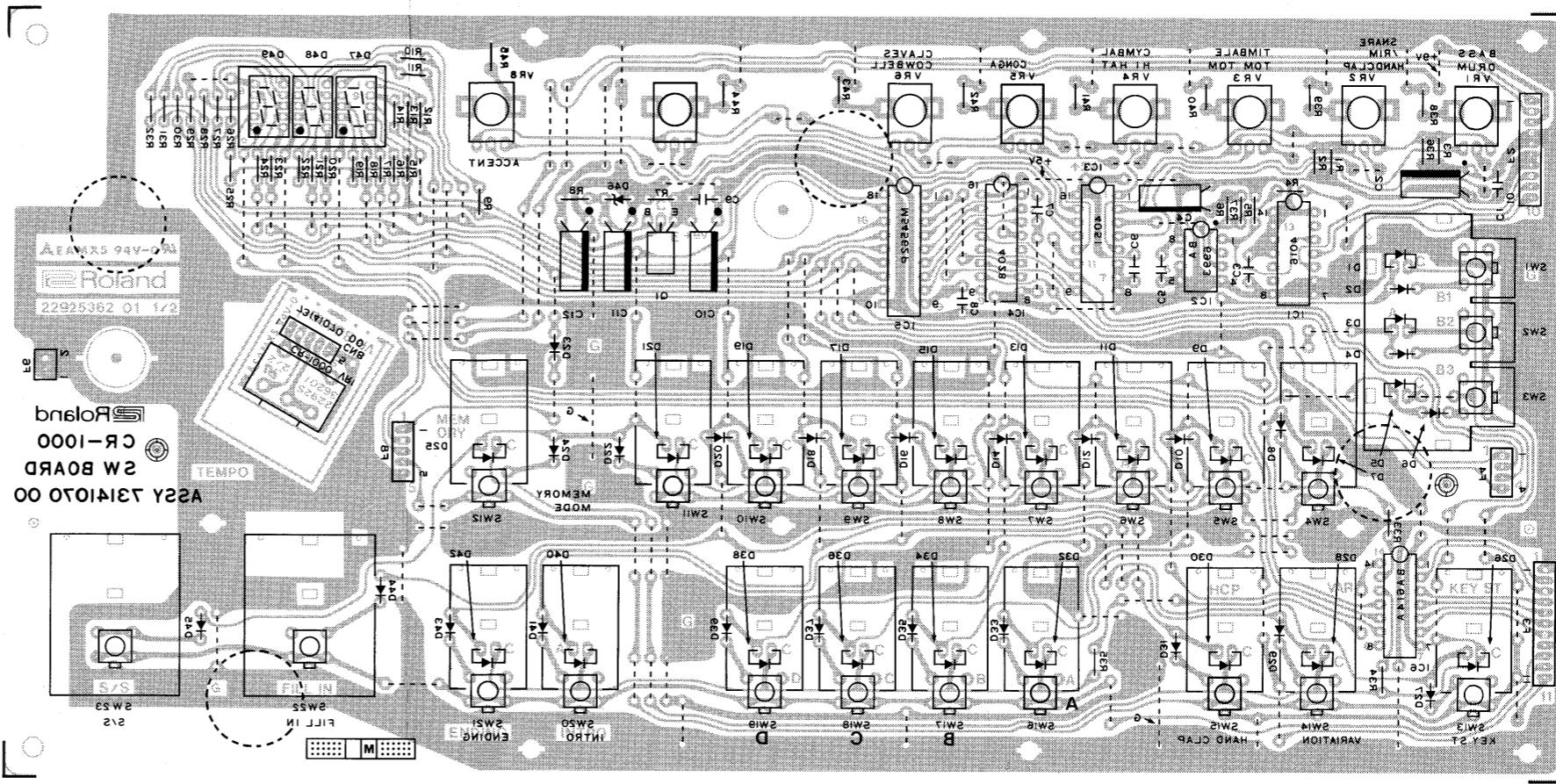
Lithiumbatteri. Explosionsrisk.
Får endast bytas av behörig servicetekniker.
Se instruktioner i servicemanualen.

Lithium batteri för endast ersättas med samma typ och fabrikat.

VAROITUS!

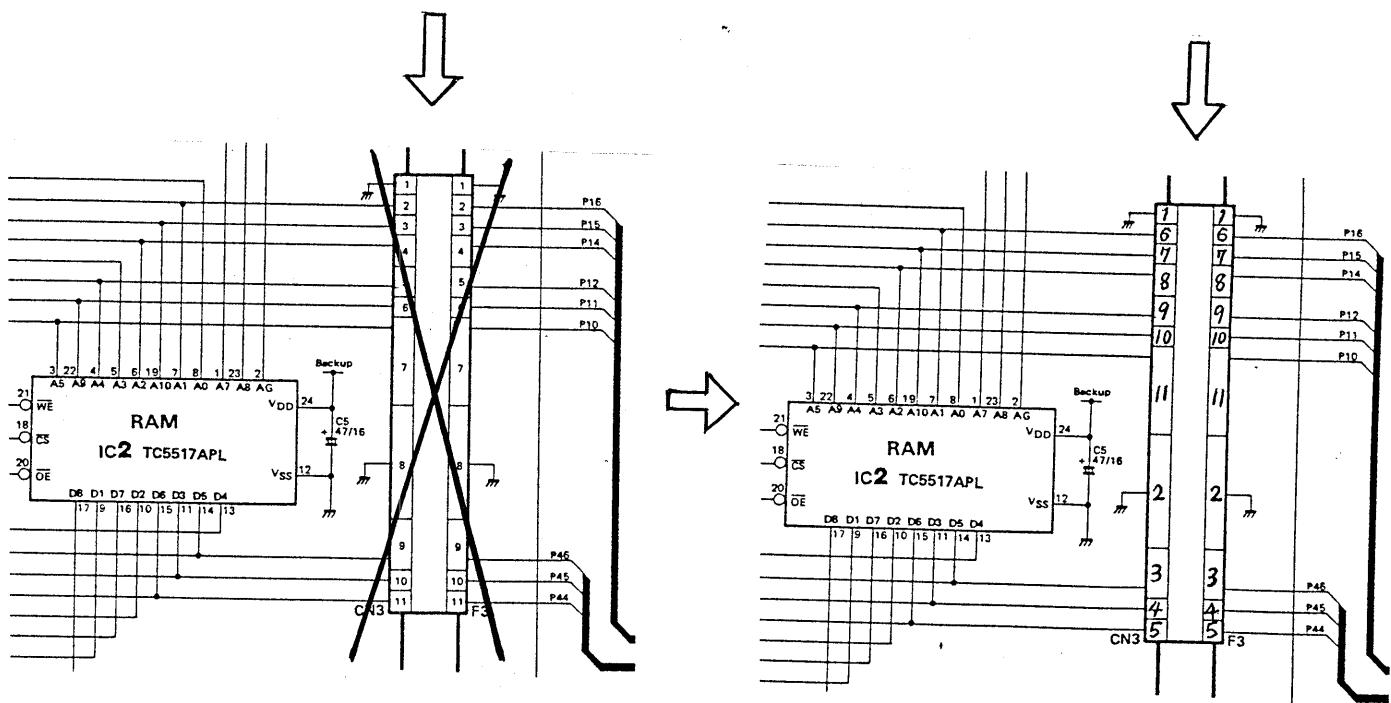
Lithiumparisto. Rajähdysvaara.
Pariston saa vaihtaa ainoastaan
alan ammattimies.

Kun vaihat lithium pariston KÄYTÄ saman valmistajan samaa tyypinä.



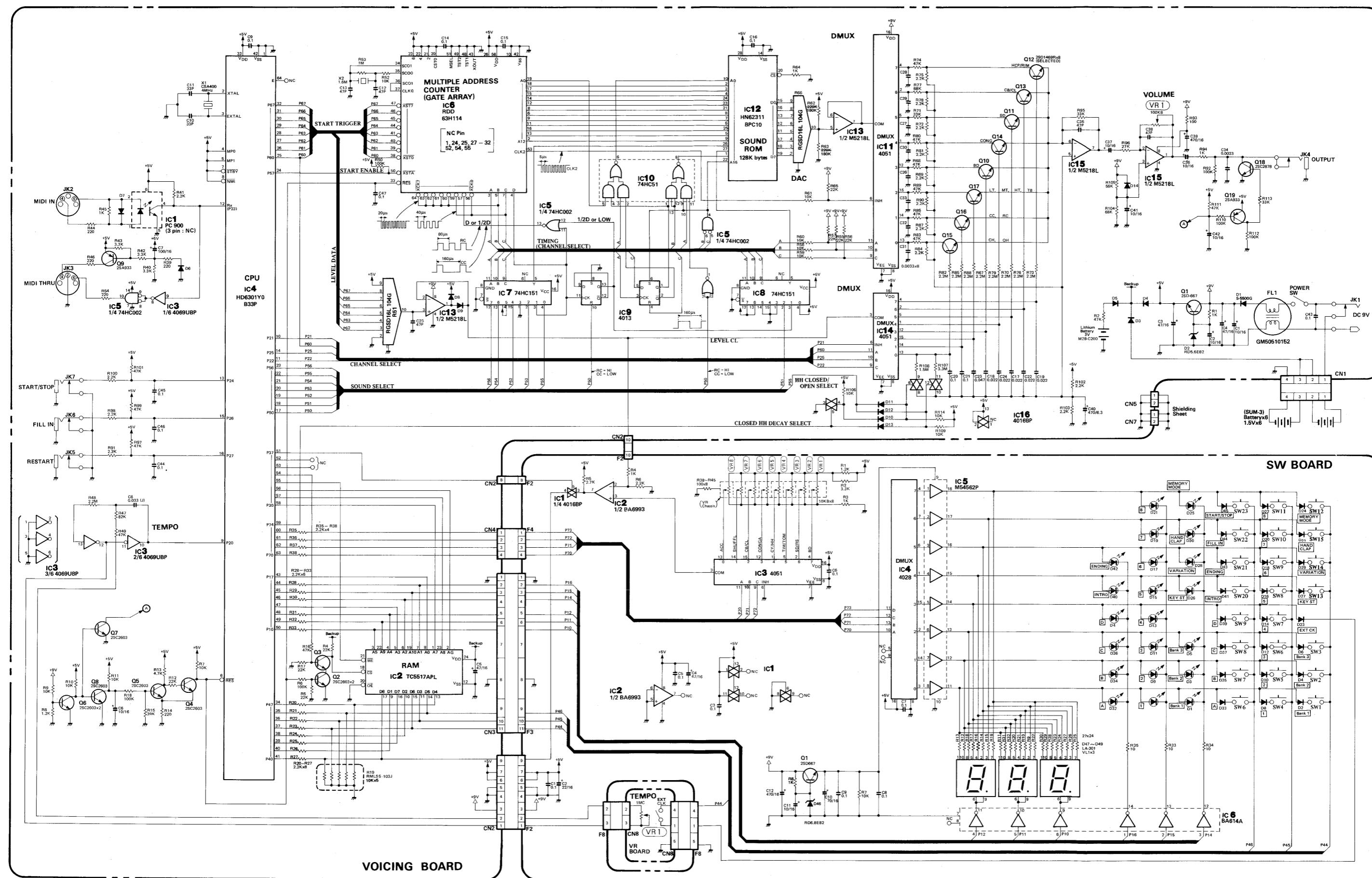
CR - 1000

訂正 CORRECTION



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39

CIRCUIT DIAGRAM



Rhythm machine

MODEL CR-1000 MIDI Implementation

1. RECOGNIZED RECEIVE DATA

1.1 In NORMAL and MIDI SYNC mode.

| Status | Second | Third | Description |
|-----------|-----------|-----------|---|
| 1001 nnnn | 0kkk kkkk | 0vvv vvvv | Note ON 0kkk kkkk = 0 - 127 0 - 54 0vvv vvvv = 1 - 127 |
| 1011 nnnn | 0111 1100 | 0000 0000 | OMNI OFF |
| 1011 nnnn | 0111 1101 | 0000 0000 | OMNI ON |
| 1100 nnnn | 0ppp pppp | | Program change 0ppp pppp = 0 - 51, 56 - 63 |

1.2 In MIDI SOUND MODULE mode.

| Status | Second | Third | Description |
|-----------|-----------|-----------|---|
| 1001 nnnn | 0kkk kkkk | 0vvv vvvv | Note ON 0kkk kkkk = 35 - 76 0vvv vvvv = 1 - 127 |
| 1011 nnnn | 0111 1100 | 0000 0000 | OMNI OFF |
| 1011 nnnn | 0111 1101 | 0000 0000 | OMNI ON |

Notes :

*1 For 'KEY START' function. If the function is set, rhythm sequence will start when any 'NOTE ON' message is received.

*2 For 'NUANCE' function. If the power has been applied while INTRO/FILL IN/ENDING PATTERN SELECT KEY 'B' being held down, velocity of these notes will affect 'nuance' of rhythm.

*3 This message is ignored if the power has been applied while INTRO/FILL IN/ENDING PATTERN SELECT KEY 'A' being held down.

*4 Program numbers are assigned as follows.

| Prog # | RHYTHM | Prog # | RHYTHM |
|--------|-----------|--------|-----------------------|
| 0 | ROCK 1 | 8 | ROCK 1 (VARIATION) |
| 1 | ROCK 2 | 9 | ROCK 2 (VARIATION) |
| 2 | ROCK 3 | 10 | ROCK 3 (VARIATION) |
| 3 | ROCK 4 | 11 | ROCK 4 (VARIATION) |
| 4 | DISCO 1 | 12 | DISCO 1 (VARIATION) |
| 5 | DISCO 2 | 13 | DISCO 2 (VARIATION) |
| 6 | 16-BEAT 1 | 14 | 16-BEAT 1 (VARIATION) |
| 7 | 16-BEAT 2 | 15 | 16-BEAT 2 (VARIATION) |

| Prog # | RHYTHM | Prog # | RHYTHM |
|--------|------------|--------|------------------------|
| 16 | WALTZ | 24 | WALTZ (VARIATION) |
| 17 | SWING 1 | 25 | SWING 1 (VARIATION) |
| 18 | SWING 2 | 26 | SWING 2 (VARIATION) |
| 19 | SHUFFLE | 27 | SHUFFLE (VARIATION) |
| 20 | CHARLESTON | 28 | CHARLESTON (VARIATION) |
| 21 | BALLADE | 29 | BALLED (VARIATION) |
| 22 | REGGAE | 30 | REGGAE (VARIATION) |
| 23 | TANGO | 31 | TANGO (VARIATION) |

| Prog # | RHYTHM | Prog # | RHYTHM |
|--------|-----------|--------|-----------------------|
| 32 | SAMB | 39 | SAMB 1 (VARIATION) |
| 33 | SAMB 2 | 41 | SAMB 2 (VARIATION) |
| 34 | MERENGUE | 42 | MERENGUE (VARIATION) |
| 35 | MAMBO | 43 | MAMBO (VARIATION) |
| 36 | CHA CHA | 44 | CHA CHA (VARIATION) |
| 37 | RHUMBA | 45 | RHUMBA (VARIATION) |
| 38 | BEGUINE | 46 | BEGUINE (VARIATION) |
| 39 | BOSSANOVA | 47 | BOSSANOVA (VARIATION) |

Prog # FILL IN

| | |
|----|----------------|
| 48 | FILL IN - A ON |
| 49 | FILL IN - B ON |
| 50 | FILL IN - C ON |
| 51 | FILL IN - D ON |

Prog # INTRO/ENDING

| | |
|----|------------------|
| 56 | INTRO/ENDING - A |
| 57 | INTRO/ENDING - B |
| 58 | INTRO/ENDING - C |
| 59 | INTRO/ENDING - D |
| 60 | INTRO OFF |
| 61 | ENDING OK |
| 62 | ENDING OFF |
| 63 | ENDING OFF |

Program numbers 52-55 and 64-127 are ignored.

*5 MIDI SYNC mode only.

Rhythm machine

MODEL CR-1000 MIDI Implementation Chart

| Function | Recognized | | Remarks |
|------------------|--|--|-----------------------------|
| | mode I | mode II | |
| Basic Channel | Default Changed | 1 1-16 | OMNI ON OMNI OFF |
| Mode | Default Messages Altered | Mode 1 OMNI ON/OFF | MONO/POLY ignored |
| Note Number | True voice | *1 0-127 (0-54) | ** 35-76 ** instrument # |
| Velocity | Note ON Note OFF | ○ v=1-127 X | ○ v=1-127 X |
| After Touch | Key's Ch's | X X | X |
| Pitch Bender | | X | X |
| Control | | X | X |
| Change | | | |
| Prog Change | True # | *2 (0-51, 56-63) | X |
| System Exclusive | | X | X |
| System Common | Song Pos Song Sel Tune | X X X | X |
| System Real Time | Clock Commands | ○ (MIDI SYNC mode) ○ (MIDI SYNC mode) | X |
| Aux | Local ON/OFF All Notes OFF | X X | X |
| Mes- sages | Active Sense Reset | X X | X |
| Notes | CR-1000 has no transmitter. mode I: NORMAL or MIDI SYNC mode. mode II: MIDI SOUND MODULE mode. *1 0-127 for 'KEY START' function, 0-54 for 'NUANCE' function. *2 Can be set to ○ or X by power-up setting. | | |

Mode 1: OMNI ON, POLY
Mode 2: OMNI ON, MONO
Mode 3: OMNI OFF, POLY
Mode 4: OMNI OFF, MONO

Mode 1: OMNI ON, MONO
Mode 2: OMNI OFF, MONO

○ : Yes
X : No